COLORADO RIVER RECOVERY PROGRAM Project No.: 131
FY-2007 PROPOSED SCOPE OF WORK

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

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Category
_ Ongoing project
_ Ongoing-revised project
xx Requested project
_ Unsolicited proposal

Expected Funding Source
xx Annual funds
__ Capital Funds
__ Other

I. Title of Proposal: **Population Estimate of Humpback Chub in Black Rocks.**

II. Relationship to RIPRAP: General Recovery Program Support. V. Monitor Populations. A.1. Conduct standardized monitoring program.

III. Study Background/Rationale and Hypotheses: Robust population estimates are now critical to monitor recovery of the humpback chub population (USFWS 2001). Recovery goals require estimates of population size at regular intervals to measure population response to management activities under the Recovery Program. A population estimate was made for the 1998–2000 time period (McAda 2002) and a second estimate was made for 2003 – 2004. This scope of work identifies the work necessary to complete a third estimate of population size for humpback chub in Black Rocks.

IV. Study Goals, Objectives, End Product:

A. Goal:

Estimate size and recruitment of the humpback chub population in Black Rocks

B. Objectives:

1. Use mark-recapture to estimate the population size (including adults ≥200 mm TL) and recruitment (i.e., juveniles 150–199 mm TL) of humpback chub in Black Rocks.

2. Describe population structure of humpback chub in Black Rocks by analyzing length-frequency distributions.

V. Study area: Upper Colorado River Basin — Black Rocks area (RM 135.5–136.5)

VI. Study Methods/Approach:

Recovery Program (2002) summarized population estimates conducted through 2001 and made recommendations for sampling methodologies for future work. The study methodology outlined here corresponds to those recommendations.

Conduct four intensive 4-day (3 nights) sampling efforts in Black Rocks between mid September and late October in 2003 and 2004, with intervals of 1–2 weeks between samples. Capture as many adult-size chubs as possible using the most efficient gear for handling as many fish as possible for the effort expended. Sampling will encompass the entire length of Black Rocks occupied by humpback chub to ensure that all fish have an equal chance of being captured.

Based on previous field efforts the most effective gear is 1-in inner mesh trammel nets (McAda 2002; Chart and Lentsch 1999). However, there is some concern that trammel nets can produce injuries that might lead to delayed mortality if not used carefully (McAda 2002). To reduce stress to humpback chub, sampling will be done in fall as temperatures are falling in the river (mid September through October). Trammel nets will be run every hour to the extent possible, with 1.5 hr as the absolute maximum length of set. Fewer nets may be set than during the previous study to ensure that maximum length of set is not exceeded.

Extensive sampling will also be done with electrofishing, seining and hoop nets. The extra sampling will especially target chubs < 200 mm TL to estimate population size of fish about to recruit into the adult population. Recapture rates for fish this size are currently unkown, so catch per effort may have to be relied on to estimate recruitment rates. The extra sampling will also be used to evaluate techniques that might supplement or replace (if deemed necessary) trammel netting and reduce potential stress to the fish.

All specimens captured will be identified to species using criteria described by Douglas et al. (1989, 1998). Careful examination and use of specific criteria will be especially important for fish < 200 mm which can be difficult to distinguish to species. After handling, all chubs will be treated in a salt dip (1.5%, ~1 min) before release. In addition, treatment with a commercial fungicide (200 ppm, ~1 hr) will be explored. However, use of the fungicide will require holding the fish in a tank with aeration for about one hour before release.

A longer-term evaluation of delayed mortality will be attempted after further evaluation. Twenty fish captured by trammel nets will be held in live cages until the week of sampling is completed. Those 20 fish will then be transported to tanks at Horsethief SWA and held for two weeks to assess long-term mortality. Fish will be monitored daily to assess their health. At the end of two weeks the fish will be returned to Black Rocks and released. Before this evaluation is attempted consideration will be given to the possibility of disease problems at the hatchery confounding results or introducing a disease to the wild population.

Measure to total length ($\pm$ 1 mm) and weigh ($\pm$ 20 g) all Colorado pikeminnow and humpback chubs captured. PIT tag all Colorado pikeminnow and humpback chubs greater than 160 mm total length. Identify and count all sympatric fishes collected during all sampling efforts.

Capture-recapture data for humpback chub will be placed into a matrix and runt through program CAPTURE. A population estimate will be calculated using the model most suitable for the sampling methods used. Population trends and population size structure will be determined using standard techniques described in Recovery Program (2002). Analysis of similar data collected during 1998 – 2000 indicated that capture probabilities (P^) ranged from 0.04–0.09 and coefficient of variation (CV) ranged from 0.13–0.54 (McAda 2002). These parameters varied with catch rates and number of sampling trips, but the current study will attempt to produce P^s > 0.07 and CV s $\leq$ 0.25.

VII. Task Description and Schedule

1. Sample humpback chubs in Black Rocks; fall 2007 (FY 2007 and FY 2008); and fall 2008 (FY 2008 and FY 2009).

2. Compile data annually, prepare preliminary population estimate to be made available before the winter Colorado River researchers meeting and provided to the Recovery Program and USFWS for evaluation. Estimates will include numbers of adults (≥200 mm TL) in the population, as well as recruitment by juveniles (150–199 mm TL); winter 2007 – 2008 and 2008 – 2009.

3. Complete final report describing population size and structure of humpback chub in Black Rocks; winter, spring, summer 2009. Draft report May 1, 2009. Final Report, August 1, 2009.

VIII. FY-2007

Task 1

IX. Budget Summary

FY-2007

Task 1

Labor	
Project Leader (1 week @ 2180)	$ 1,980
Administrative Officer (2 weeks @ 1365)	$ 2,729
Fishery Biologist (4 weeks @ 1965)	$ 7,860
Biological Technicians (2, 3 weeks @ 1088)	$ 3,825
Labor subtotal	$ 16,394
Equipment and Supplies	
Office Supplies (phones, paper, computer supplies, Misc)	$ 500
Field Equipment	
Vehicle rental (2 @ 300 month)	$ 600
Boat and Vehicle gasoline	$ 650
Trammel Nets (6 @ 210)	$ 1,260
Motor and boat repair	$ 600
Equipment subtotal	$ 3,600
Travel/Per Diem	
Field Work (2 wk, 3 people @ 40 day)	$ 240
Meeting (2 people, 2 days @ 150 day)	$ 600
	$ 840
Total	$ 20,834

Note: Most work will occur in FY 2008 and FY 2009. This is intended to be a place holder for FY 07 until more complete scopes of work are developed for FY 08 and FY 09

X. Reviewers:

XI. References

Chart, T. E., and L. D. Lentsch. 1999. Flow effects on humpback chub (Gila cypha) in Westwater Canyon. Final Report to Upper Colorado River Endangered Fish Recovery Program, Project Number 39. Utah Wildlife Resources, Moab and Salt Lake City, Utah.

Douglas, M.E., R.R. Miller, and W.L. Minckley. 1998. Multivariate discrimination of Colorado Plateau Gila spp.: The "art of seeing well" revisited. Transactions of the American Fisheries Society 127:163–173.

Douglas, M.E., W.L. Minckley, and H.M. Tyus. 1989. Qualitative characters, identification of Colorado River chubs (Cyprinidae: genus *Gila*) and the "art of seeing well." Copeia 1989:653–662.

McAda, C. W. 2002. Population size and structure of humpback chub in Black Rocks, Colorado River, Colorado. Draft final report to Upper Colorado River Endangered Fish Recovery Program, Project Number 22-a-3. U.S. Fish and Wildlife Service, Grand Junction, Colorado.

Recovery Program (Program Director's Office, Upper Colorado River Endangered Fish Recovery Program). 2002. Protocols for Colorado pikeminnow and humpback chub population estimates. Draft Final Report to Upper Colorado River Endangered Fish Recovery Program. U. S. Fish and Wildlife Service, Denver, Colorado.

USFWS (U. S. Fish and Wildlife Service). 2001. Recovery goals for the endangered fishes of the upper Colorado River Basin. Draft Report, U. S. Fish and Wildlife Service, Denver, Colorado.